

Remarks

The Office Action mailed September 13, 2005 has been carefully considered.

In this response, claims 1 – 19 inclusive have been amended herein to more clearly recite the present invention. Claims 20-32 have been newly added. No new material has been added to the amended or newly added claims.

In paragraph 2 of the Office Action, the Examiner objected to the Markush language in claims 6 and 16. Claims 6 and 16 have been amended herein.

In paragraphs 3-4, the Examiner rejected claims 1 and 11 under the second paragraph of 35 U.S.C. 112 because the weight basis of the components was not specified. Claims 1 and 11 have been amended to include the weight basis for the individual components. Withdrawal of this rejection is requested.

In paragraphs 5-6, the Examiner rejected claims 1-19 under 35 U.S.C. § 103(a) as being unpatentable over Harada et al. (EP 0927753 A2) or Johnson et al. (WO 95/11932) or Choi et al. (US 5,032,628); and Sun et al. (US 6,124,391) individually in view of Nagata et al. (US 5,567,744).

As disclosed in the present invention, the thermoplastic resin is added as a surface treatment to the superabsorbent particles. Harada et al. specifically discloses on page 14, lines 15 to 25, that during adding a surface treatment to the water-absorbent resin particles, the particles can be subjected to a surface-treating agent while controlling the temperature of the particles in the range of 20 to 80°C, preferably in the range of 30 to 60°C and subsequently surface-treating the particles. Harada et al. specifically states on page 14, lines 20-22, “If the temperature of the particles deviates from the range specified above, the particles intended to be

mixed with the surface-treating agent will tend to agglomerate and, as a result, the produced water-absorbent resin will possibly exhibit an unduly low ratio of cubic expansion due to water-absorption under load.”

The Examiner states that it would have been obvious to one of ordinary skill in the art at the time of the invention to include appropriate amounts of thermoplastic binder including the claimed range in the composition disclosed in Harada et al. As stated above Harada et al. specifically discloses surface treatment of the particles is limited to a temperature range of 20 to 80°C. On the other hand Nagata et al. discloses bonding or fusing the thermoplastic resin by heating the composite of particles thermoplastic resin, binder and organic solvent to a temperature that softens the thermoplastic resin and distills off the solvent. Nagata et al discloses the thermoplastic resins have a softening point of from 40 to 200°C and in the examples, Nagata et al discloses the temperature of the composite is raised to 100°C to distill off the organic solvent. Contrary to the Examiner’s position, one of ordinary skill in the art would not include appropriate amounts of thermoplastic binder in the composition as disclosed in Harada et al due to the surface treatment temperature limitation found in Harada et al.

Neither Johnson et al. (WO 95/11932) nor Sun et al. (US 6,124,391) disclose the use of penetration modifiers added immediately before, during or immediately after the surface crosslinking step as surface treatment for a superabsorbent polymer. Since Johnson et al and Sun et al do not disclose a superabsorbent composition comprising a penetration modifier according to the present invention, it is respectfully requested that the rejection over Johnson et al. and Sun et al. be withdrawn. Withdrawal of Johnson et al. and Sun et al. would make the rejection of claims 1-19 over Johnson et al. or Sun et al. in view of Nagata et al moot.

Choi et al cannot have the properties of the present invention for the reasons set forth herein and should be withdrawn. Two properties of the present invention are Centrifuge Retention Capacity (CRC) and Gel Bed Permeability (GBP). The tests to measure these properties are set forth in the specification on pages 18 to 22 for Gel Bed Permeability and on pages 23 to 25 for the Centrifuge Retention Capacity Test. Each of these two tests require the tested sample to be prepared from particles retained on a U.S. standard 50 mesh screen (300 μ m opening) resulting in superabsorbent polymer sample having particles sized in the range of about 300 to about 600 microns. See pages 20 and 23 of the specification.

Choi et al. specifically discloses superabsorbent polymer having average particle size of 100 to 150 μ m and cannot have the Centrifuge Retention Capacity and Gel Bed Permeability properties of the present invention because the superabsorbent polymer particles in Choi et al cannot be tested for Centrifuge Retention Capacity and Gel Bed Permeability in accordance with the tests of the present invention. Choi et al. specifically discloses at column 4, lines 27 to 30, "When the particle size is less than 100 μ m, it is deemed to decrease the effect of surface crosslinking but, when the particle size is over 150 μ m, the water absorptive rate is decreased." The smaller sized superabsorbent polymer particles of Choi et al were not designed to be tested by the Centrifuge Retention Capacity and Gel Bed Permeability tests of the present invention and hence would not inherently include the Centrifuge Retention Capacity and Gel Bed Permeability properties of the present invention. Since it has been shown Choi et al cannot have the Centrifuge Retention Capacity and Gel Bed Permeability properties of the present invention, it is respectfully requested that the rejection over Choi et al. be withdrawn. Withdrawal of Choi et al. would make the rejection of claims 1-19 over Choi et al. in view of Nagata et al moot.

In paragraph 7, on page 8, the Examiner opines that it would have been obvious to one of ordinary skill in the art at the time of the invention to coat the hydrogel particles of Harada et al. or Johnson et al. or Choi et al. or Sun et al. with the hydrophilic waxes as disclosed by Engelhardt et al. and thereby obtain the instant invention. The present invention specifically requires the superabsorbent polymer composition to include a surface additive of a thermoplastic polymer. Engelhardt et al. does not disclose coating a superabsorbent polymer with a thermoplastic polymer as set forth in the present invention. Engelhardt does not disclose a thermoplastic polymer in the list of examples of waxes found in column 4, lines 1-36. In addition, Engelhardt et al. defines waxes in column 3, lines 30 – 47, to include the properties that a wax is of relatively low viscosity even only slightly above the melting point. It is well known to those skilled in the art that thermoplastics do not have a low viscosity at slightly above the melting point. In particular, thermoplastics have a relatively high viscosity at temperatures near the melting point and well above the melting point.

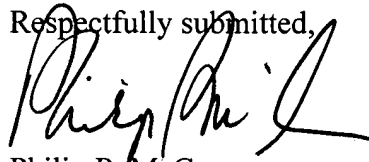
Furthermore, Engelhardt et al defines waxes to have a dropping point. The dropping point of a fat or oil is the temperature at which the sample will become fluid to flow under the conditions of the test. The scope of the test is applicable to hydrogenated and nonhydrogenated fats and oils that solidify sufficiently when held at -5°C or lower for the allotted time.

Furthermore, Engelhardt et al does not disclose that a thermoplastic polymer is applied to the superabsorbent polymer particle surface coincident with or followed by a temperature at least about the thermoplastic melt temperature or greater. Since Engelhardt et al. fails to disclose application of thermoplastic polymers to superabsorbent polymers, Engelhardt et al should be withdrawn as a reference.

For the reasons set forth above, the withdrawal of Johnson et al., Choi et al, and Sun et al. would make the rejection of claims 1-19 over these references in view of Nagata et al moot.

In light of the amendments and remarks presented herein, Applicants submit that Claims 1-32 of the case are in condition for immediate allowance. If Examiner Sastri has any further questions or if any issues remain unresolved, the Examiner is invited to telephone Applicants' counsel at the number provided below.

Respectfully submitted,



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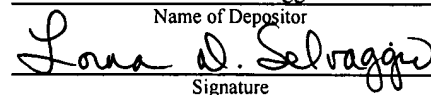
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